National Institute of Environmental Health Sciences

Monthly district level risk of dengue occurrences in Sakon Nakhon Province, Thailand

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Abstract:

The paper deals with the incidence of the Dengue Virus Infection (DVI) in the 18 districts of Sakon Nakhon Province, Thailand, from January 2005 to December 2007. Using a statistical and autoregressive analysis to smooth incidence data, we have constructed yearly and monthly district level maps of the DVI distribution. It is found that the DVI incidence is very correlated with weather conditions and higher occurrences are observed in the three most populated districts Wanon Niwat, Sawang Daen Din and Mueang Sakon Nakhon, and the virus transmission period spans from mid-summer to mid-rainy seasons (from April to August). Employing a Generalized Linear Model (GLM), we found that the DVI incidences were related with current meteorological (monthly minimum temperature, past 2-month cumulated rainfall) and socio-economical (population of 0-4. years old, per capita number of public small water wells, and proportion of villages with primary schools) covariates. and using the GLM under the climate change conditions (A1B scenario of IPCC), we found that the higher risk of DVI spreads from the three most populated districts to less populated ones, and the period of virus transmission increases from 5 to 9. months to include part of winter, summer and rainy seasons (from March to November) during which 6%, 61% and 33% of districts will be at low, medium and high risk of DVI occurrences, respectively. © 2010 Elsevier B.V.

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Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Other Climate Scenario

Other Climate Scenario: SRES A1B

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Tropical

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Thailiand

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Children

Resource Type:

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content